ADVANCED DATA VISUALIZATION
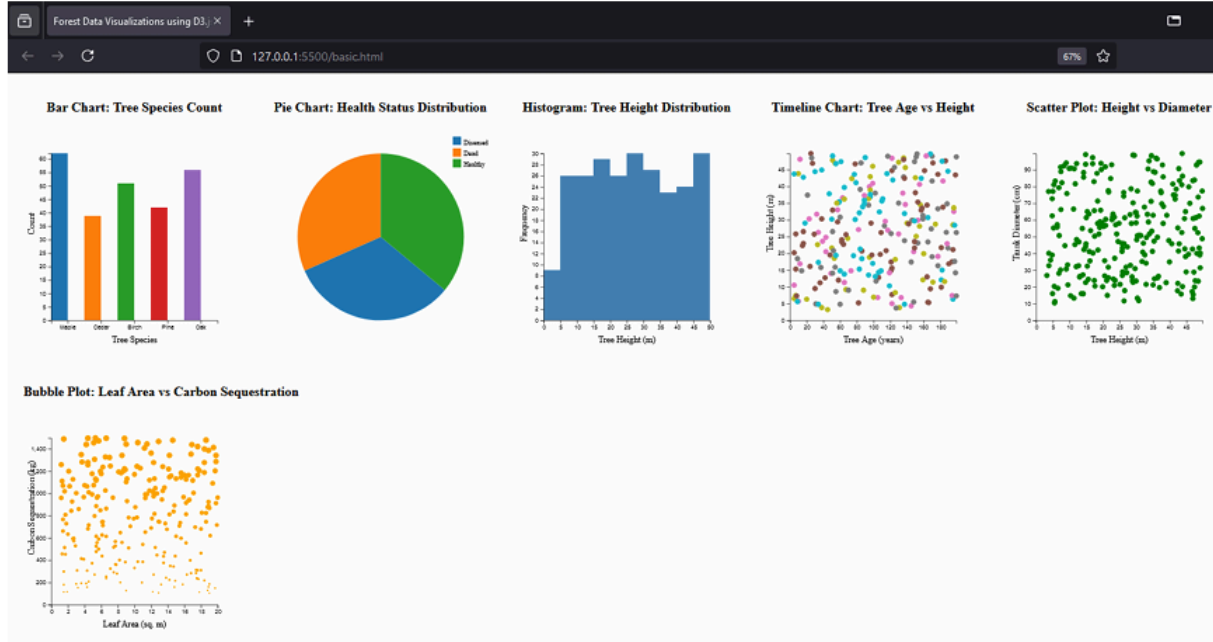## EXPERIMENT 8

NAME: Hrimkar Doshi
ROLL NO: 20217000021
BATCH: L
CSE - DS

Plots and Their Observations

1. Bar Chart: Top 10 Product-wise Sales

- **Plot Description**:
  A vertical bar chart showcasing the top 10 products based on total sales (in INR).
- **Process**:
  - **Tools**: Python (Matplotlib/Seaborn) or Tableau.
  - **Metric Calculated**: Summation of sales grouped by `Product SKU`.
  - **Visualization**: SKUs on the X-axis, sales on the Y-axis.
- **Observation**:
  - Product `R123456-M` achieved the highest sales (~₹500,000).
  - A close competition exists among the top-performing SKUs, with the lowest of the top 10 still contributing significant revenue.

○ The trend highlights a few products contributing disproportionately to overall sales.

---

2. Pie Chart: Region-wise Sales

- **Plot Description**:
  A pie chart representing the percentage share of total sales contributed by each region.
- **Process**:
  - **Tools**: Python (Matplotlib/Plotly) or Tableau.
  - **Metric Calculated**: Summation of sales grouped by `Region`.
  - **Visualization**: Pie slices representing sales contribution, labeled with percentages.
- **Observation**:
  - "Other" regions contribute the most (29.2%), indicating a significant portion of sales outside the primary regions.
  - Maharashtra leads among specific states with 17% of total sales, followed by Karnataka (13.3%).
  - West Bengal and Kerala have lower contributions (~4–5%), indicating potential areas for growth.

---

3. Histogram: Order Amount Distribution

- **Plot Description**:
  A histogram displaying the frequency of orders based on their amount (INR).
- **Process**:
  - **Tools**: Python (Seaborn) or Power BI.
  - **Metric Calculated**: Distribution of order amounts divided into bins.
  - **Visualization**: Number of orders (Y-axis) vs. order amounts (X-axis).
- **Observation**:
  - A majority of orders lie within ₹0–₹1,000, suggesting a focus on low-value transactions.
  - There is a steep decline in the frequency of orders above ₹1,000.
  - Outliers exist above ₹2,000 but form a negligible portion of total orders.

---

4. Timeline Chart: Sales Over Time

- **Plot Description**:
  A timeline chart showing sales trends across months.
- **Process**:
  - **Tools**: Tableau or Python (Matplotlib).
  - **Metric Calculated**: Monthly summation of sales grouped by `Date`.
  - **Visualization**: X-axis represents time, and Y-axis represents total sales.
- **Observation**:
  - Sales peak during certain months, likely due to seasonal factors or sales events.
  - A steady increase is observed in specific periods, highlighting potential growth opportunities.
  - Sales dips may correspond to off-season months or lack of promotional events.

---

5. Scatter Plot: Sales vs. Discount

- **Plot Description**:
  A scatter plot showing the relationship between sales amounts and discounts offered.
- **Process**:
  - **Tools**: Python (Seaborn) or Tableau.
  - **Metric Calculated**: Sales plotted against the percentage of discounts.
  - **Visualization**: Sales (Y-axis) vs. Discount (X-axis).
- **Observation**:
  - Higher discounts correlate with increased sales volume, but the trend is non-linear.
  - Some high-value orders are made with little to no discounts, highlighting demand for premium products.

---

6. Bubble Plot: Product Category vs. Sales

- **Plot Description**:
  A bubble plot illustrating product categories and their contribution to sales, with bubble size representing the total sales for each category.
- **Process**:
  - **Tools**: Tableau or Python (Plotly).
  - **Metric Calculated**: Summation of sales grouped by `Category`.
  - **Visualization**: X-axis represents categories, Y-axis represents average order value, and bubble size represents total sales.
- **Observation**:

- Categories like Electronics and Home Appliances dominate in terms of sales.
  - Some categories with smaller bubbles may indicate underperforming product lines or niche markets.

Conclusion

The visualizations provided actionable insights into sales distribution by product, region, and order characteristics. Key observations suggest focusing marketing efforts on high-performing regions and SKUs while exploring strategies to grow sales in underperforming regions. Further analysis could involve customer segmentation and profitability analysis to optimize business strategies.

Let me know if you need assistance creating these visuals!